(No Model.) 5 Sheets—Sheet 1.

E. GREEN.

TYPE WRITING MACHINE.

No. 501,651. Patented July 18, 1893.

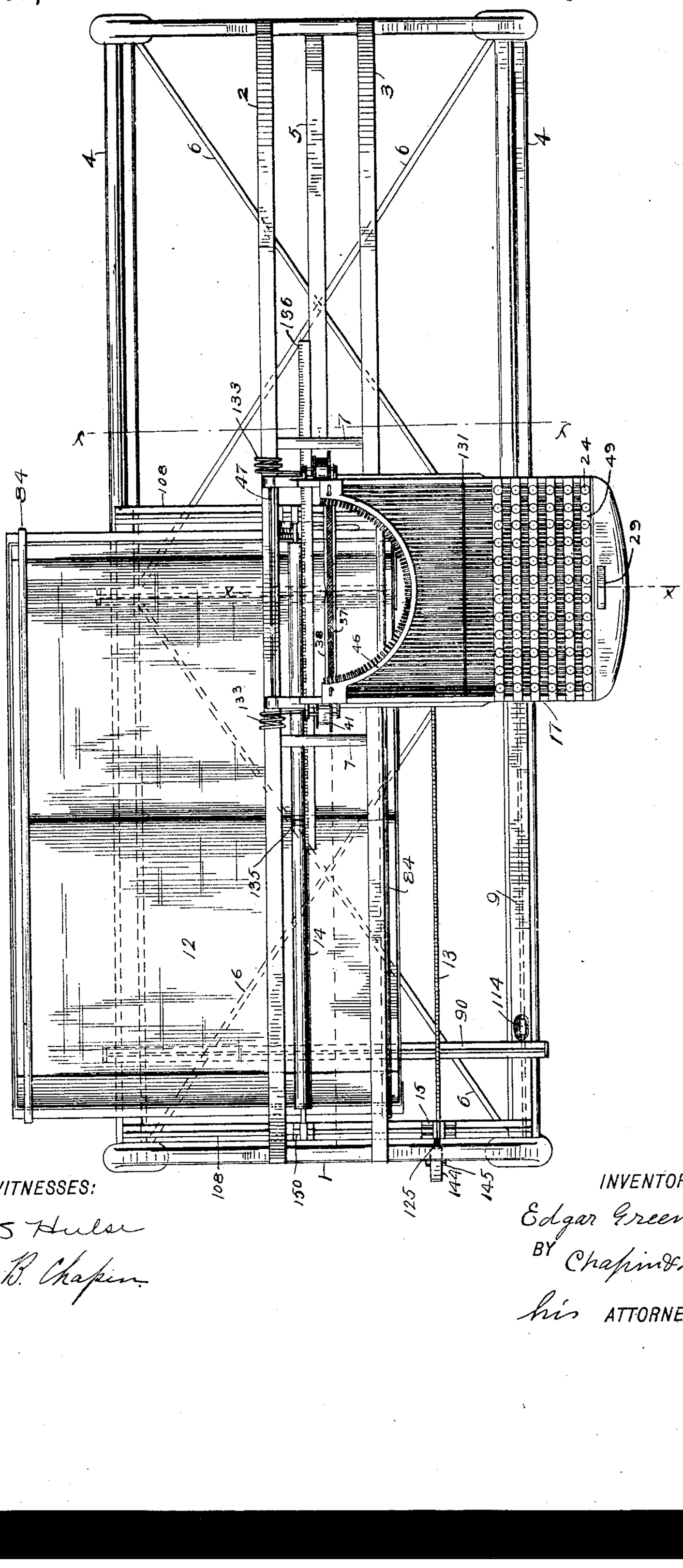

Fig. 1.

WITNESSES:

W S Hulse

K. B. Chapin.

INVENTOR

Edgar Green

BY Chapin & Denny

his ATTORNEYS.

(No Model.) 5 Sheets—Sheet 2.

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TYPE WRITING MACHINE.

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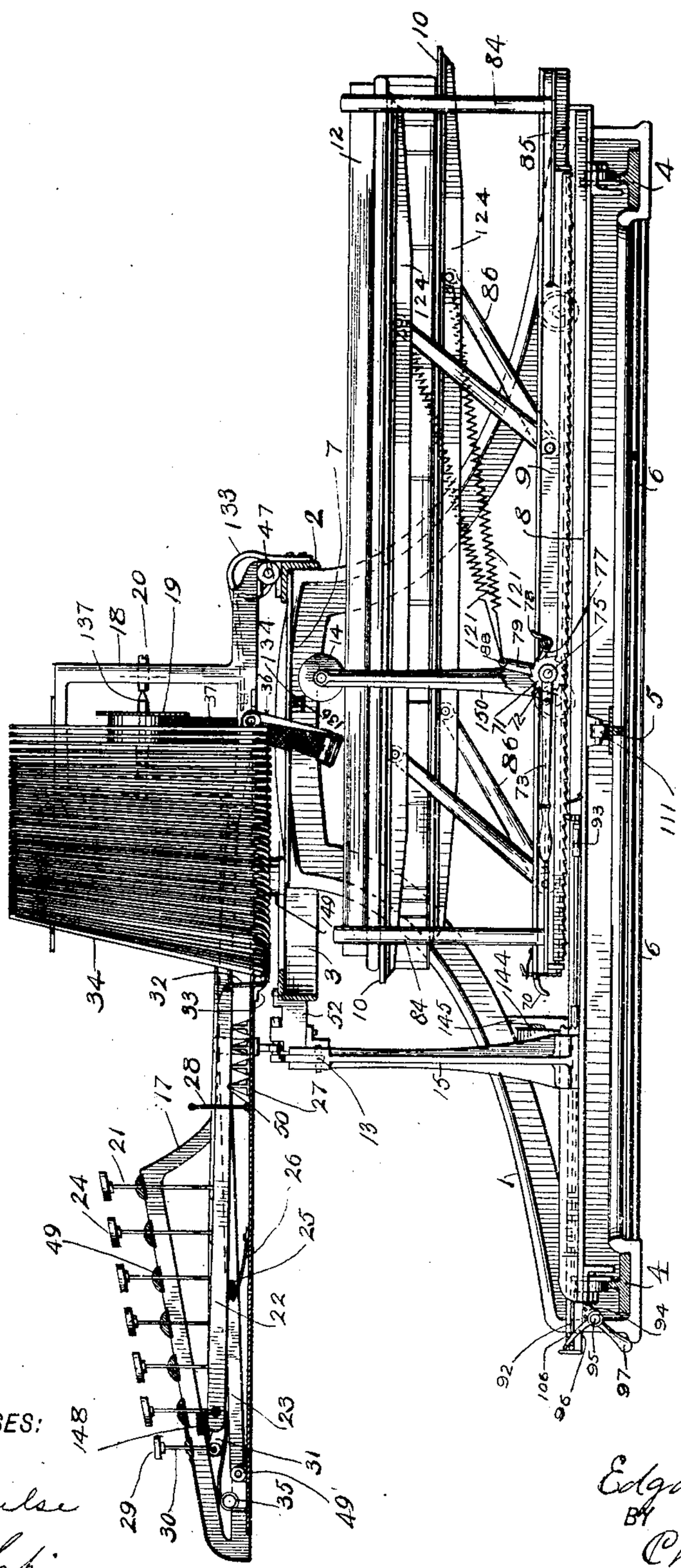

Fig. 2.

WITNESSES:

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(No Model.) 5 Sheets—Sheet 3.

E. GREEN.

TYPE WRITING MACHINE.

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Fig. 3.

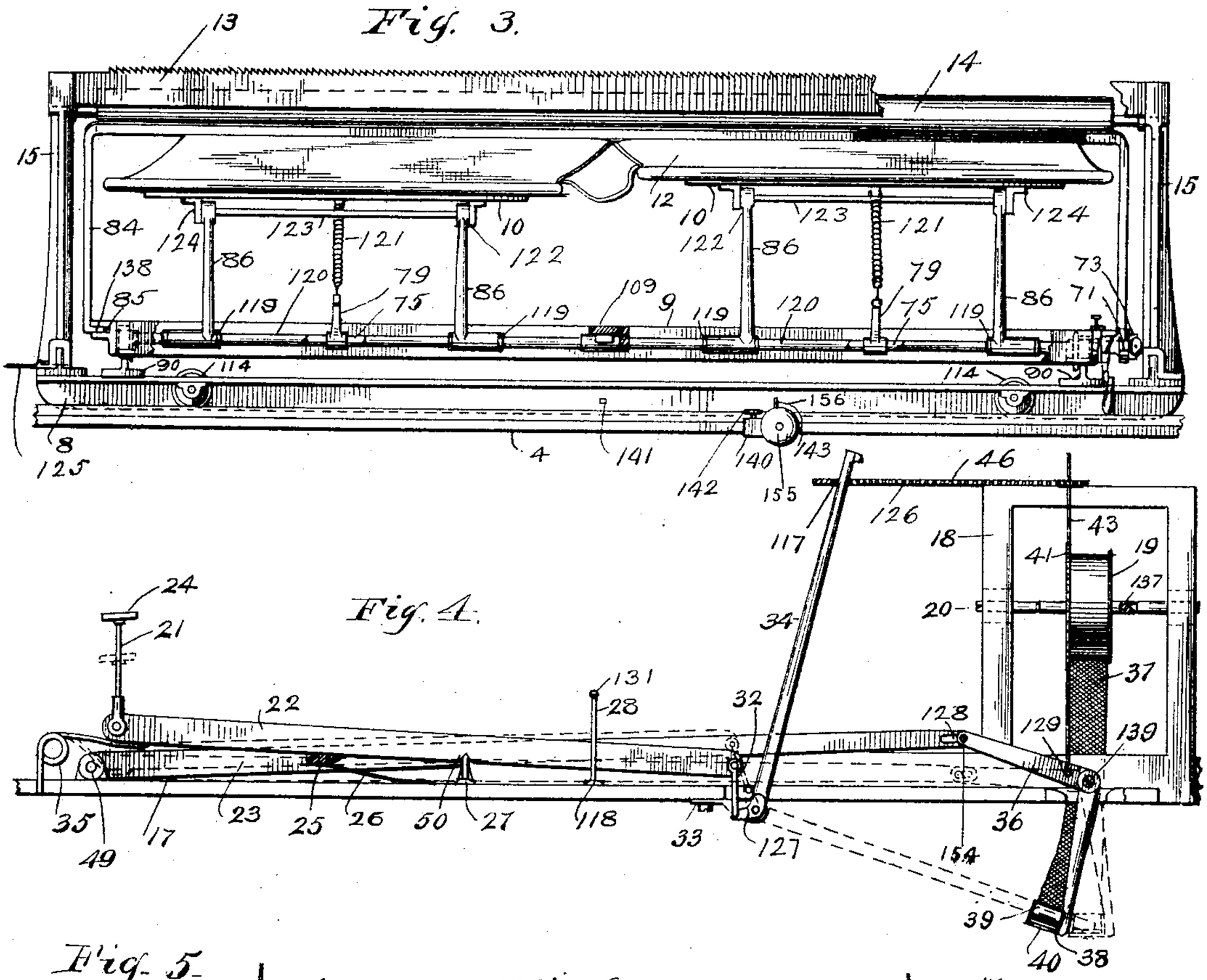


Fig. 4.

Fig. 5.

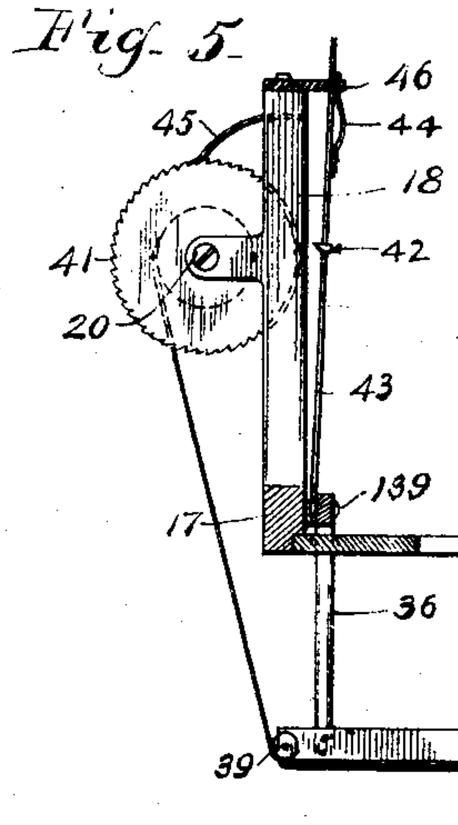
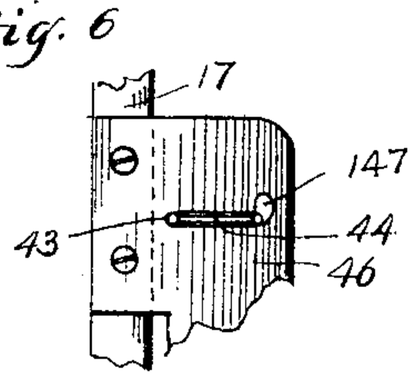
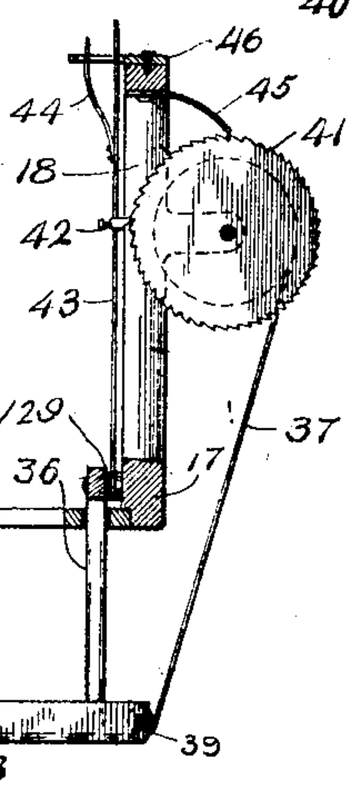


Fig. 6





WITNESSES:

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(No Model.)

5 Sheets—Sheet 4.

E. GREEN.

TYPE WRITING MACHINE.

No. 501,651. Patented July 18, 1893.

Fig. 7.

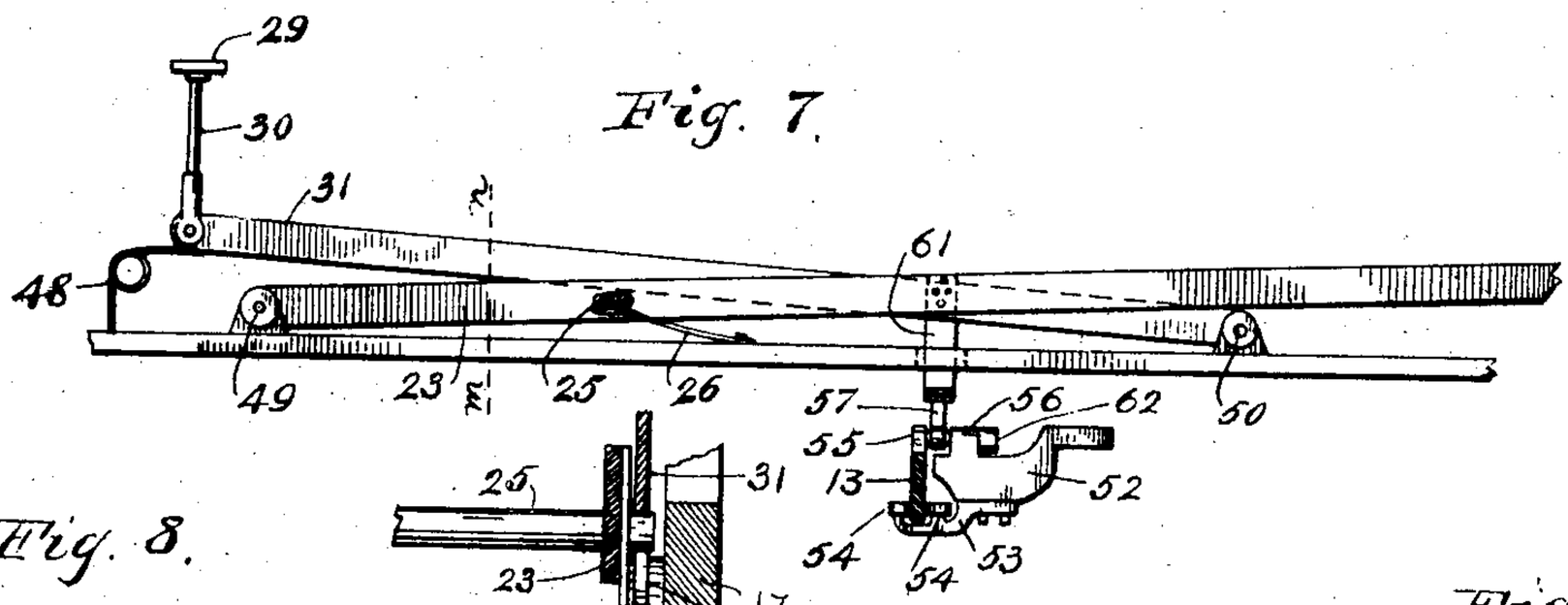


Fig. 8.

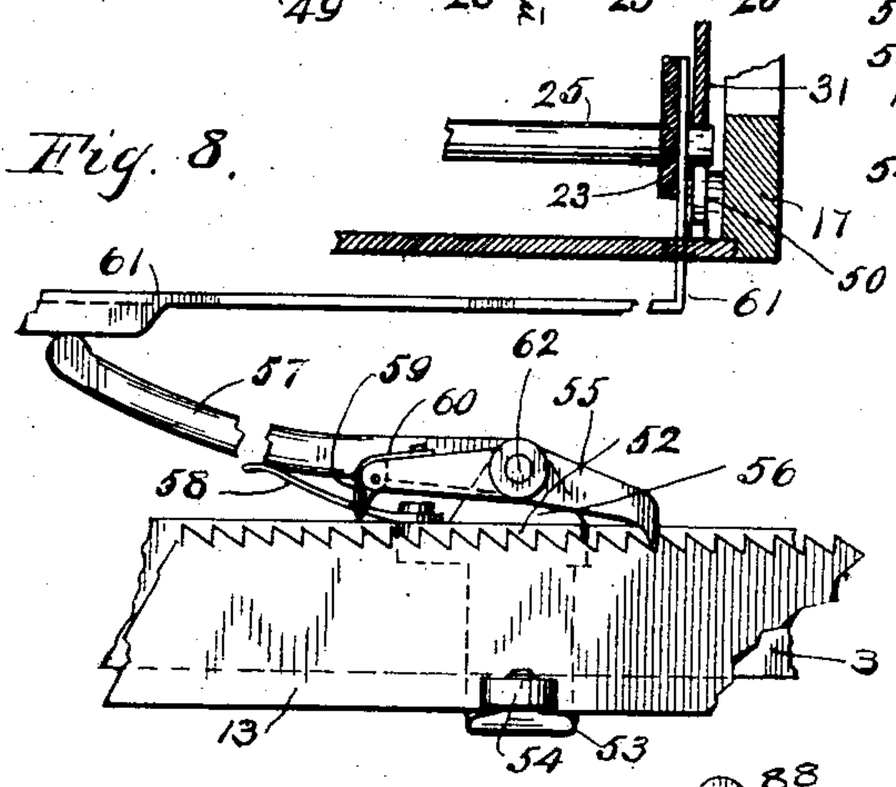


Fig. 9.

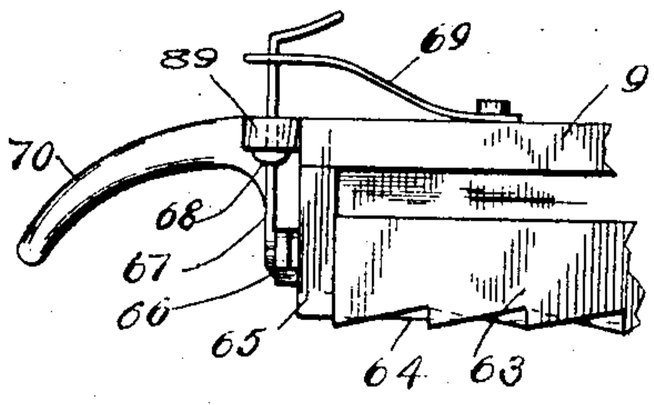


Fig. 10.

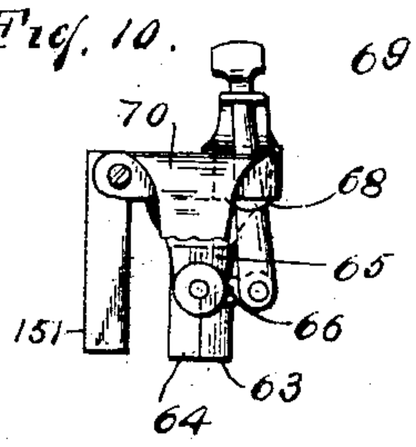


Fig. 11

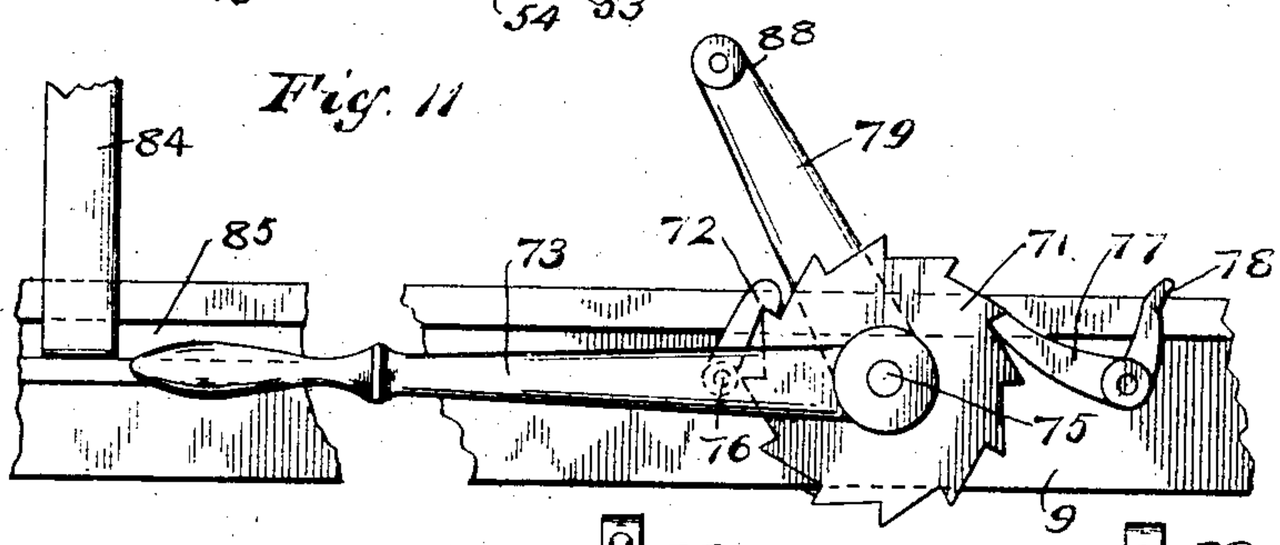


Fig. 12.

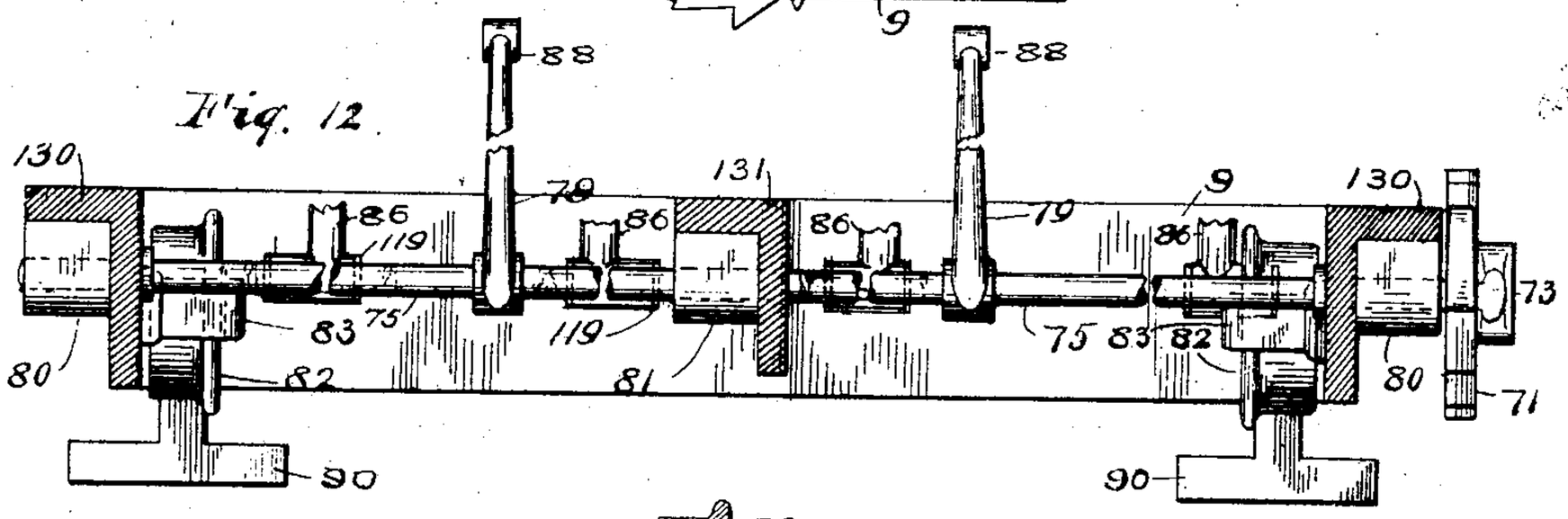
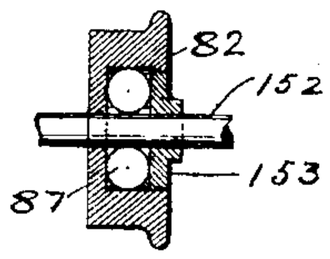


Fig. 13



WITNESSES:

W. S. Hulse

K. B. Chapin

INVENTOR

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his ATTORNEYS.

(No Model.)

5 Sheets—Sheet 5.

E. GREEN.

TYPE WRITING MACHINE.

No. 501,651. Patented July 18, 1893.

Fig. 14

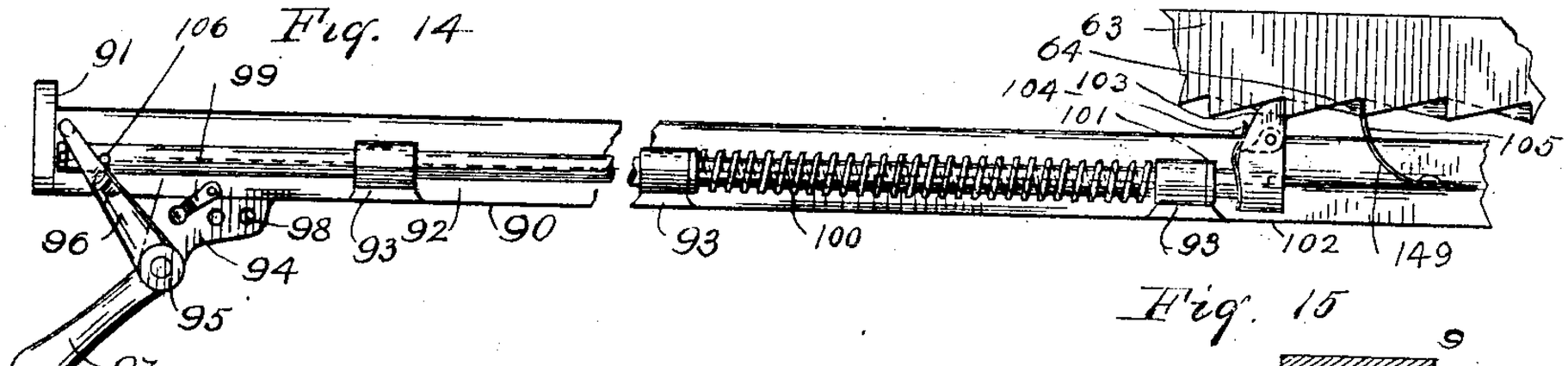


Fig. 15

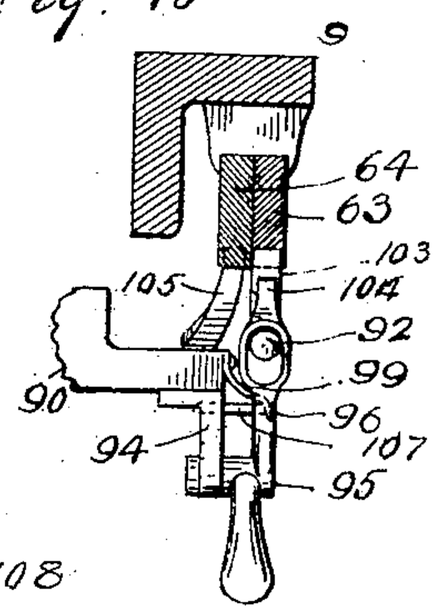


Fig. 16

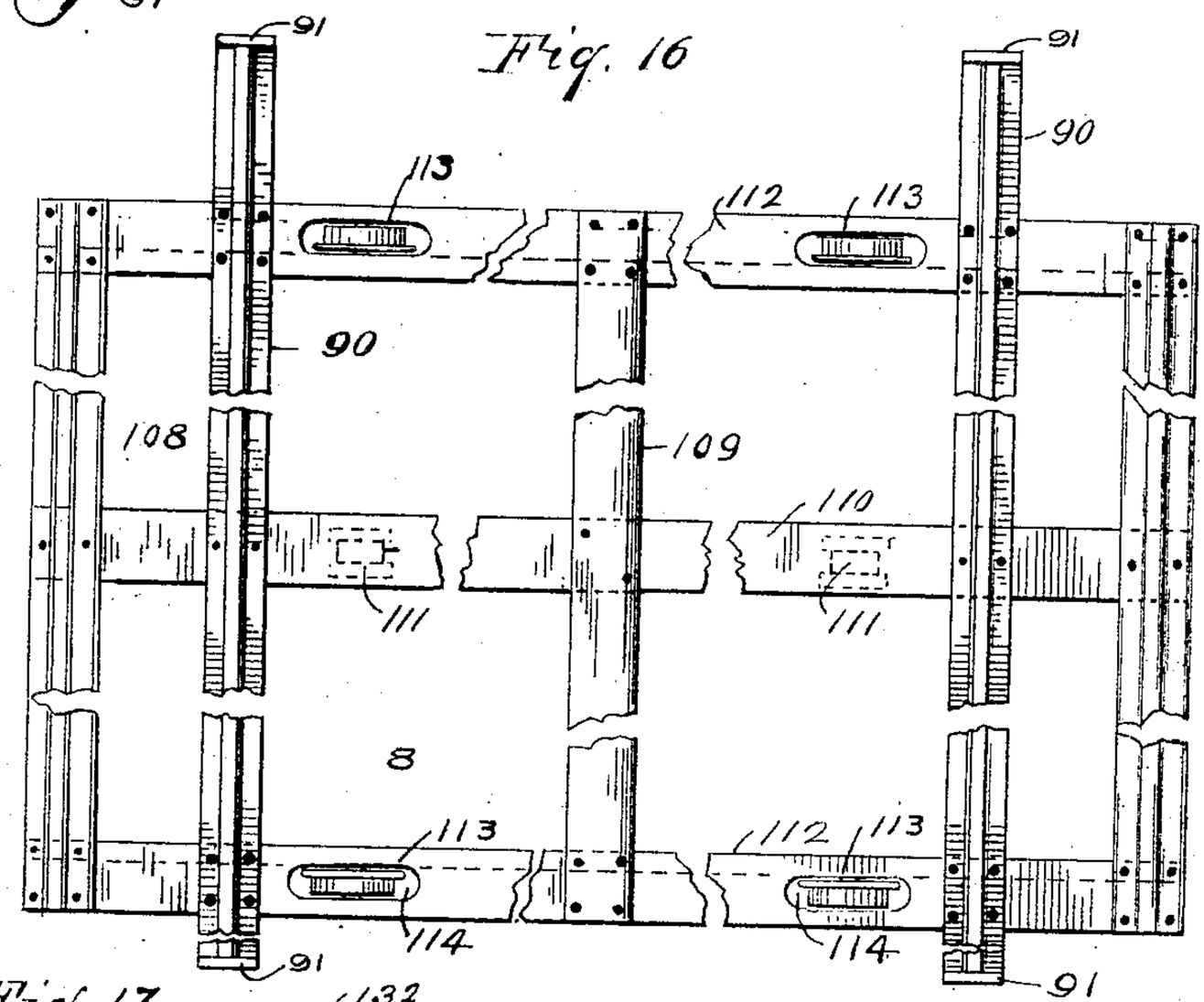


Fig 17

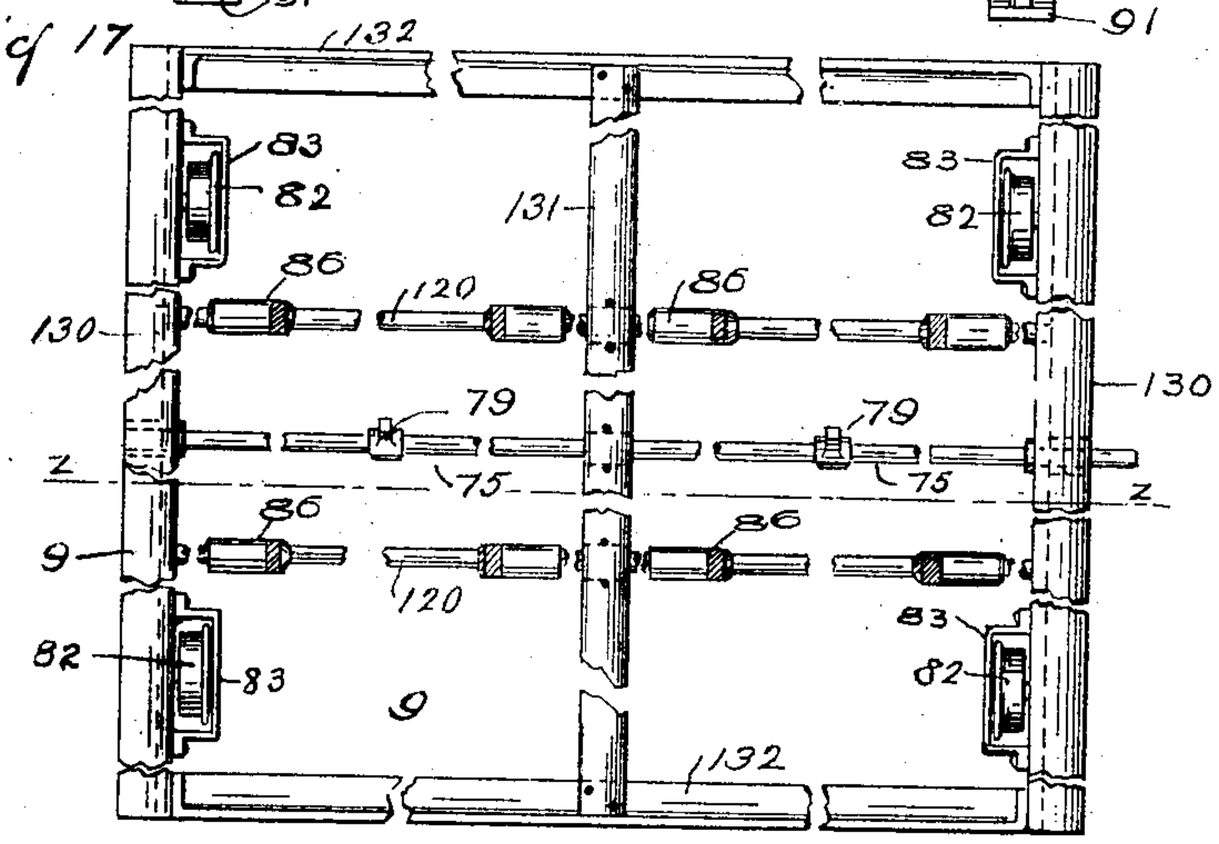


Fig. 18

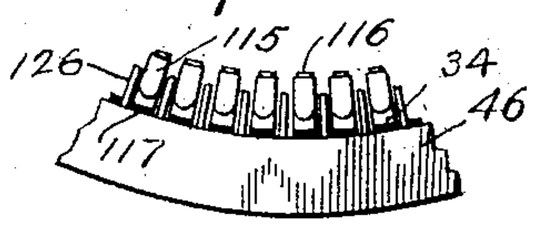
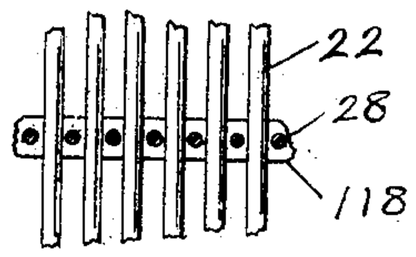


Fig. 19.



WITNESSES:

W. S. Hulse

K. B. Chapin

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his ATTORNEYS.

UNITED STATES PATENT OFFICE.

EDGAR GREEN, OF ALBION, INDIANA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 501,651, dated July 18, 1893.

Application filed October 1, 1892. Serial No. 447,454. (No model.)

To all whom it may concern:

Be it known that I, EDGAR GREEN, a citizen of the United States, residing at Albion, in the county of Noble, in the State of Indiana, have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in that form of type-writing machines in which the type-bars are thrown downward in such a manner that the writing is visible to the operator as the work progresses and which is especially adapted for writing in blank books and official records.

The object of my invention therefore, is to provide a type-writing machine of simple and economical construction, provided with a strong and substantial book-rest or support adapted to be conveniently and efficiently employed in the support and suitable adjustment of blank books and official records of all sizes and of every variety, in position for writing thereon, and also be adapted to be used with equal facility for writing upon tablets or upon single detached sheets of paper.

My invention consists in the novel construction and combination of the several parts, as will be hereinafter set forth and particularly pointed out in the claims.

The object of my invention thus indicated, is accomplished by the mechanism illustrated in the accompanying drawings forming part of this specification, in which similar figures indicate corresponding parts in the several views.

Figure 1 is a plan view of my improved machine. Fig. 2 is a vertical transverse section of my invention on lines x—x and y—y of Fig. 1. Fig. 3 is a front elevation of the carriages, with the book or record to be written upon, in position upon the book-rest, the front portion of the frame of the upper carriage being broken away to show the attachment of the arms of the book-rest. Fig. 4 is an enlarged detail view of the type-bar mechanism, the ribbon and mechanism for shifting the same. Fig. 5 is a detail view of the ribbon mechanism in elevation, the left side of the figure being a vertical section outside of the reel frame and the right side a vertical section inside of said frame. Fig. 6 is an enlarged plan view of the reel mechanism. Fig. 7 is a detail view of the word spacing device in combination with the universal bar and rack mechanism. Fig. 8 is a view in detail of the letter spacing device. Fig. 9 is a detail side view of the device for disengaging the upper carriage rack from the line spacing pawl. Fig. 10 is a front elevation of the same. Fig. 11 is a detail view of the device for elevating the book-rest. Fig. 12 is a section in elevation of Fig. 17 on the line z—z, showing the central shaft in combination with the upper carriage, with the wheels and the upper track. Fig. 13 is a central vertical section of the carriage wheel showing the antifriction ball bearings therefor. Fig. 14 is a detail of the line spacing device in section. Fig. 15 is a front elevation of the same. Fig. 16 is a plan of the lower carriage, carrying the transverse tracks. Fig. 17 is a plan of the upper carriage in section. Fig. 18 is a plan of the upper semicircular plate in section showing the guides for the type bars or arms. Fig. 19 is a plan of the guides for the main levers.

Referring now to the accompanying drawings, all the operating mechanism of my invention is shown as mounted in or upon a main frame comprising the end castings I united by the T rail plate 4, which frame thus constructed may be of any proper size, design and material, and having a general rectangular form, with a contracted top and gracefully curved sides. The end pieces I, preferably cast in one piece, may be provided at each corner with rubber feet, to avoid scratching and noise, and are also connected by a central longitudinal bar or base plate 5 preferably in the form of an inverted T rail which serves as a central track for the lower carriage, hereinafter described, which plate is strengthened and supported by the cross pieces 6, preferably four in number.

Mounted upon the top of the castings I or end pieces of said frame, and extending from one end of said frame to the other, are the angle iron plates 2 and 3 adapted to support the key-board frame with its key-levers, type-bars and other operating mechanism. The angle iron plate 3 is curved outwardly at its center in such a manner as to admit of its

passing beneath the key-levers without obstructing the operation of the type-arms. The angle iron plates are rigidly braced near their centers, for the support of the key-board, by suitable cross pieces or bracing plates 7, at a proper distance upon either side of the key-board.

To the lower surface of the cross plates 7, I rigidly secure a graduated scale or gage 136 for indicating the relative location of the type-impressions across the page upon which the machine is designed to operate.

Upon the sides 4 of the base frame, so constructed as to form a suitable T rail track, is mounted a longitudinally moving carriage 8, adapted for letter spacing, and having flanged wheels 113 adapted for retaining the carriage upon said tracks. The sides 108 of said carriage are preferably constructed of angle irons, provided with suitable lugs to which the wheels 113 are pivoted, and having suitable longitudinal slots 114 in which said wheels can freely turn, as seen in Fig. 3. The carriage 8 is also provided with a wheel or roller 111 adapted to roll upon the central track or plate 5, seen in Fig. 2. The ends of said carriage are also preferably constructed of angle irons 108, upon which are rigidly mounted the upright standards 15 in the top of which the rack-bar 13 is rigidly mounted, and the standards 150 in which the roller 14 is journaled. Carriage 8 may be further strengthened and braced by the cross pieces 109 and 110. At suitable places on said carriage are properly mounted and rigidly secured thereto the transverse T rail tracks 90, provided with suitable lugs or bumpers upon the ends thereof, Fig. 16.

Mounted upon the tracks 90 is a second or upper carriage 9 having its ends formed of the angle irons 132 and its sides of the angle irons 130 the said frame being further strengthened by the plate or angle iron 131. This transversely movable carriage 9 is provided with the flanged wheels 82, adapted for rolling upon the tracks 90, and properly pivoted in the lugs 83, which are secured to the inner surface of the plates 130. Equally distant from the ends of said carriage is pivotally mounted in the sides thereof, the revoluble shaft 75, having suitable bearings in the boxings 80, Fig. 12, and having rigidly mounted upon one end thereof the ratchet wheel 71, and also having the pivotally mounted hand lever 73 adapted for elevating the book-rest hereinafter described. Rigidly mounted upon the said shaft in any proper manner are the two shafts 79, having perforated heads 88 to which the end of the coil wire spring may readily be secured.

72 and 77 are dogs or pawls for engaging ratchet wheel 71, and 78 is a thumb lever for the operating pawl 77.

To the sides of the carriage 9, and at a proper distance upon either side thereof, and parallel thereto are rigidly secured the shafts 120, having pivotally mounted thereon the standards 86, preferably eight in number. The sides of carriage 9 are provided with the longitudinal slots 85, into which are adjustably secured the ends 138 of the rectangular frame or book clamp 84, which is adapted for longitudinal adjustment in the slots 85, to suit different sized books or records.

The wheels 82 and 113 are preferably provided with anti-friction ball bearings as seen in Fig. 13.

Upon the outside of the upper carriage 9 are rigidly secured the double racks 63 and 64, seen in Figs. 2, 14 and 15. The rack 63 is disengaged from the line spacing pawl 102 having a loose or movable end 103, by pressing downward the thumb lever 67 in the guide 89, which lever when released will be returned to position by the spring 69. When the rack 63 is thus disengaged from the said pawl the operator, by seizing the handle 70 Fig. 9 can readily draw carriage 9 forward at pleasure. The spring 149 Fig. 14 is secured to the side of carriage 9, and is adapted to prevent the carriage 8 from running forward when the machine is placed upon an incline.

To one side of the lower carriage 8 is secured in a proper manner the lug or plate 94 Fig. 14 having perforations 98, and the collars 93, in which is adjusted the line spacing device consisting of the rod 92 on which is properly mounted the coil spring 100, and the pawl 102 having a loose end 103 and having a spring 104 secured thereto.

To the plate or lug 94 is pivotally mounted the bell-crank lever 96 having a handle 97, which crank lever is adapted to operate the rod 92 and the pawl 102 for line spacing, which spaces are measured by the spring 99 when properly adjusted in perforations 98.

To the base plate 4 is secured at any desired point the bell or alarm 155, for announcing to the operator the approach to the end of the line, said bell having a bell hammer 156, and a lug 140 for the set screw 142. The side of said carriage 8 is also provided with a pin or short arm 141 adapted for engagement with the bell hammer 156 in any proper manner.

The standards 86, heretofore described, are pivotally secured to the shafts 123, which shafts are rigidly secured to the angle iron plates 124, upon the upper surface of which are properly secured the book-rest plates 10, which plates are adapted to be vertically adjusted by the hand lever 73 and the spiral springs 121.

The writing mechanism, hereinafter described, is rigidly stationary above the movable carriages, which are adapted for line and letter spacing, properly secured to a key-board frame 17, preferably cast in one piece. The plate 17 is pivoted at one extremity to the shaft 47 supported by the angle iron 2, and is adapted to be readily elevated to a vertical position, assisted by the strong coil springs 133. The frame 17 with its operating mechanism mounted thereon is further supported

upon either side thereof by suitable supports 149 firmly secured to the upper side of the angle iron 3 seen in Fig. 2.

The key-board as constructed embraces a suitably sloping plate properly perforated for the key stems and is surmounted by a series of removable and perforated steps or banks 49, of thin metal, through which the stems 21 of the keys 24 play up and down freely in the usual and well known manner. The usual finger keys, preferably seventy-two in number, are arranged in any desired order upon the said banks or steps. Said keys include both the upper and lower case letters, with the proper punctuation marks and other desired characters.

The top or button of key 24 is preferably made of hard rubber and may be made to screw upon the stem or adapted to be otherwise detachably mounted thereon.

The ordinary key levers 22 for printing the characters are shown as arranged horizontally and parallel with each other and as rocking upon a common axis, consisting of a series of knife blade fulcrums 27.

To the base of the key board frame is firmly secured a transverse base plate upon which is arranged a suitable number of vertical guides for the key levers 22, the said guides being stayed and secured at their upper extremities by the top plate 131 Fig. 19.

The type arms or levers 34, carrying the types or printing characters 116, at their swinging ends, are pivoted or fulcrumed at one extremity to the base of the key-board, in any proper manner, preferably by means of the lugs 33 and the perforated lugs or plates 127, between which lugs the said type bar is pivoted. The said lug 127 is also joined to the key lever 22 by means of the connecting rod 32 in a well known manner. The lugs or plates 33 may be so constructed and connected to the base of the key-board as to bring the fulcrum of the type levers 34 much lower than in the construction shown, and much nearer to the page upon which the type bars strike, without in the least affecting the operation or general construction of my invention. The type arms 34 are normally in a nearly vertical position, with their free or swinging ends resting against the concave surface of the semicircular bumper plate 46, said plate having a proper number of type arm guides 126, Fig. 18, between which the elastic bumpers 117, of rubber or other suitable material, are secured. Against these bumpers the backs of the type arms strike upon each return thereof to their normal position.

Mounted upon the rear end of the frame 17 and preferably cast in one piece therewith, are the upright rectangular frames 18 arranged upon either side of the key-board frame.

In the frames 18 are mounted the ribbon reels 19, having a shaft 137 adapted for needle-point bearings and holding in a proper manner the inked ribbon 37, one side of said reel being a ratchet wheel 41 adapted for engaging the pawl 42 and the bent spring 45 Fig. 5. The spring 45 is secured to frame 18 and prevents the ratchet wheel 41 from making a return movement when disengaged from the pawl 42 while the pawl 42 is secured to the rod 43, which rod is secured at its lower extremity to the bell crank 36 at 129, and thereby actuates the said ribbon reels.

The bell-crank lever 23 is properly connected with the universal bar 25, and has a longitudinal slot 128 in which the upper end of the bell crank 36 is pivoted upon the pivot 154. To the lower end of said bell-crank is rigidly secured the ribbon guide or shield 38 provided with a central longitudinal slot 40 through which the printed impression is made upon the page below.

The letter spacing rack bar 13, rigidly secured at either end, in any proper manner to the standard 15, is secured against lateral motion by the plate 52 which is rigidly secured to the angle iron 3 by means of a lug or in other proper manner, at a point midway between the standards 15. To the bottom of plate 52 is properly fastened a second plate 53 provided with rollers 54 upon either side of rack bar 13, thus securing perfect alignment under all conditions or positions of the carriages.

Plate 52 is provided with an upright lug 56 having a loose pivot 62 on which is rigidly secured the pawl-lever 57 and the double pawl 55 adapted for engagement with the rack-bar 13. One end of the pawl 55 is provided with a pivoted point or tooth held in position by the spring 60. The pawl lever 57 is held in position by the spring 58, which is secured to plate 52, while its upper extremity is engaged with the rectangular lever 61, which lever is actuated by the bell crank lever and the universal bar in a well understood manner, thus permitting the lower carriage to move on the track 4 one notch at a time. The motion power which actuates the lower carriage in its feed is a spring drum 144 containing a coiled spring 45, and the cord or metallic strap 25, which is wound upon the drum and secured at the other extremity of said carriage in any proper manner. The drum 144 is secured to the end base plate 1 in any suitable manner.

The operation of my machine thus described is, briefly stated, as follows: The book 12 is first placed in position upon the book rest 10, opened at the page upon which it is desired to print. The two parts of the said two part book rest or support are then elevated by means of the hand lever 73 until the surface of said book is tightly pressed against the frames 84. The surface of the page will be at the same time in firm contact with the lower surface of the pressure roller 14, at all times very near the line upon which the printing is being made to insure a perfectly smooth surface for the reception of the type bar. When the keys 24 are struck by the operator they actuate the proper key lever 22 which

in turn throws the type-bar 34 downward, in such a manner as to strike the inked ribbon at a point immediately above the slot 40 of the ribbon shield 38, thereby impressing the desired letter or character upon the page of book 12. But the striking of keys 24 also depresses the universal bar 25 which in turn actuates the lever 61 in contact with the free end of the pawl lever 57, which lever being rigidly secured to the shaft 62 thereby operates the double pawl 55, disengaging it from the rack bar 13 at each operation of the said universal bar, thus securing the proper word and letter spacing, by the tension of the spring 45 in its pull on carriage 8. The movement of the universal bar thus described, also actuates the bell crank lever 23, which by its connection with the bell crank 36 shifts the ribbon and ribbon shield, alternately over the line upon which the printing is being done, and then below the line, out of the line of vision, as seen in Fig. 4, thus permitting the operator to see the printing as the work progresses without the use of an additional shifting device. When it is desired to begin the printing of a new line the upper carriage is moved the proper distance by the operator, who seizes the handle 97 and withdraws the rod 92, which disengages the pawl 102 from the rack 63, until by releasing said handle the pawl 102 will engage the next notch and the coil spring 100 will force the rod 92 to its normal position as seen in Fig. 14, thus driving carriage 9, carrying the book 12 the distance of one space or to the next line. When it is desired to turn a leaf of book 12 when in position upon my machine, the operator lowers the book rest 10 to a proper position by means of the hand lever 73. The keyboard frame 17, carrying the operating mechanism, is then elevated to a nearly vertical position by the operator, assisted by the coil springs 133 which may be of any desired strength or tension, when the leaves may be conveniently turned, with all obstructions removed. In like manner the book 12 may at any time be readily and conveniently removed or replaced.

What I claim as new and useful, and desire to secure by Letters Patent, is—

1. The combination in a type-writer, of an upright base frame adapted to support letter spacing and line spacing carriages and a superposed key board with its writing mechanism, the said frame being provided with the longitudinal tracks 4 and 5 and the key board supporting plates 2 and 3, a letter spacing carriage 8 adapted for movement on said tracks, having rack-bar standards 15 and the roll supporting standards 150 rigidly mounted thereon, and provided with the transverse tracks 90 and a proper line spacing device, and a transversely movable carriage 9 mounted on tracks 90, having a revoluble shaft 75 and rigid shafts 120 mounted in the sides thereof, shaft 75 being provided with the ratchet wheel 71, the hand lever 73 and the shafts 79 for elevating the book-rest, said carriage having the adjustably mounted clamping frames 84, with a two part adjustable book rest 10 pivotally mounted on the pivoted standards 86 and the described writing mechanism mounted on the plates 2 and 3, all substantially as set forth and described.

2. In a type-writing machine, the combination of a rectangular base frame having longitudinal tracks 4 and 5 and the parallel plates 2 and 3, provided with a graduated scale 136 and a hinged key-board 17 mounted upon said plates, a longitudinally movable carriage 8 provided with the rack-bar standards 15 and roll supporting standards 150 upon either end thereof, having the rigid transverse tracks 90 and a line spacing device as described, and a transversely movable carriage 9 adapted for movement on the tracks 90, having the shafts 75 and 120 mounted thereon, said shafts having the standards 79 and 86 mounted thereon, respectively, and provided with racks 63 and 64 on the sides thereof, a ratchet wheel 71 and a hand lever 73 mounted on shaft 75 and adapted to elevate the book rest 10, and the adjustably mounted clamping frames 84, with a vertically adjustable book support 10 mounted on the pivoted standards 86 and having the coil spring 21 arranged to elevate said book support, a ribbon-reel mechanism comprising the frame 18 mounted on the said key board, the reel 19, the ribbon 37 guard 38 and the bell crank 36 and the writing mechanism mounted on said plates 2 and 3 all substantially as set forth and described.

3. In a type writer, the combination of the book support 10, the pivotally mounted brackets 86 supporting said book rest, the adjustable clamping frames 84 adapted to hold the book in position, and the revoluble shaft 75 provided with a rigid standard 79 having a coil spring secured thereto and connected with said book rest, the ratchet wheel 71 rigidly mounted thereon, the hand lever 73 pivotally mounted thereon and having a dog or pawl 72 adapted for engagement with said wheel, the pawl 77 and the thumb lever 78, all substantially as described.

4. The combination, in a type writer, of the ribbon, the ribbon reel 19 having a ratchet wheel 41 and a spring 45, the said ribbon reel being properly mounted in a supporting frame 18, with the ribbon shield 40 and the operating lever 36, all substantially as described.

5. In a type-writer, a ribbon shifting device consisting of the frame 18, the ribbon reel 19 mounted upon the shaft 137, the ratchet wheel 41, the ribbon 37, the ribbon shield 38 having a longitudinal slot 40, the bent spring 45 adapted for engagement with the ratchet wheel 41 and the operating lever 36, all substantially as set forth and described.

Signed by me this 28th day of September, 1892.

EDGAR GREEN.

Witnesses:
R. S. ROBERTSON,
J. W. HAYDEN.